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SEMINAR SERIES 2026

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Professor Lezanne Ooi

Neurodevelopment and Neurodegeneration Lab and Deputy Director (Industry Partnerships) of Molecular Horizons

Lezanne Ooi is a Professor in the School of Science at the University of Wollongong, Group Leader of the Neurodevelopment and Neurodegeneration Lab and Deputy Director (Industry Partnerships) of Molecular Horizons.
Her research is focused on how the regulation of neuronal function, neuronal excitability, ion channels, neuroinflammation, and proteostasis contribute to neurodegenerative diseases and neuronal excitability disorders. Professor Ooi earned her PhD and did postdoctoral training at the Institute of Membrane and Systems Biology, University of Leeds, UK. She established her lab at the University of Wollongong in 2012. She has received significant funding, including a National Health and Medical Research Council (NHMRC) Boosting Dementia Research Leadership Fellowship and as lead CI on grants from the Michael J. Fox Foundation (x3) and US Department of Defense (x2). She is the Deputy Director and Theme Leader of the Brain Theme of an ARC Centre of Excellence in Quantum Biotechnology (QUBIC 2023-2030) and the Cell Theme Leader of the NHMRC Centre of Research Excellence in Mechanisms in Neurodegeneration- Alzheimer's Disease (MIND-AD; 2025-2030).

From Molecules to Cells to Disease: Structural and Membrane Mechanisms Shaping Neuronal Excitability

Neuronal communication depends on precisely regulated electrical signaling, arising from the dynamic interplay between ion channels, membrane properties, and the cellular environment. In this talk, I present a multidisciplinary investigation of the mechanisms governing neuronal excitability, with a focus on Kv7 (KCNQ) potassium channels and their role in controlling action potential firing. To connect molecular structure with cellular function, my lab integrates molecular and cell biology with biophysics and structural biology. I will demonstrate how alterations in ion channel function, lipid membrane composition and reactive oxygen species disrupt electrical signaling in neurological disorders, including neurodegenerative diseases, epilepsy and pain.
Together, this work defines how ion channel–lipid interactions shape neuronal excitability across scales—from molecular structure to cellular function—and how their disruption drives neurodegeneration and hyperexcitability.